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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/318,159	05/25/1999	HOWARD E. RHODES	M4065.0335/P335-A	9990

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EXAMINER	
MUNSON, GENE M	
ART UNIT	PAPER NUMBER
2811	

DATE MAILED: 02/11/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 318,159	Applicant(s) H. RHODES	
	Examiner G. MUNSON	Group Art Unit 2811	

—The MAILING DATE of this communication appears on the cover sheet beneath the correspondence address—

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE THREE MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, such period shall, by default, expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

☒ Responsive to communication(s) filed on 22 JANUARY 2003.

☒ This action is FINAL.

☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 1 1; 453 O.G. 213.

Disposition of Claims

☒ Claim(s) 45, 46, 50-52, 54-56, 59, 60, 68-70, 73, 74, 77 is/are pending in the application.

Of the above claim(s) _____ is/are withdrawn from consideration.

☒ Claim(s) 45, 46, 50-52, 68-70 is/are allowed.

☒ Claim(s) 54-56, 59, 60, 73, 74, 77 is/are rejected.

☐ Claim(s) _____ is/are objected to.

☐ Claim(s) _____ are subject to restriction or election requirement

Application Papers

☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.

☐ The drawing(s) filed on _____ is/are objected to by the Examiner

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119 (a)-(d)

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119 (a)-(d).

☐ All ☐ Some* ☐ None of the:

☐ Certified copies of the priority documents have been received.

☐ Certified copies of the priority documents have been received in Application No. _____.

☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a))

*Certified copies not received: _____.

Attachment(s)

☐ Information Disclosure Statement(s), PTO-1449, Paper No(s). _____

☐ Interview Summary, PTO-413

☐ Notice of Reference(s) Cited, PTO-892

☐ Notice of Informal Patent Application, PTO-152

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Other _____

Office Action Summary

Claims 54-56, 59, 60, 73 and 74 are rejected under 35 U.S.C. 112, first and second paragraphs. In claim 73, a "doping concentration of said first area" appears wrong, with said "first area filled with a first dielectric material." Compare with claim 68.

The process terminology (claim 73) is considered only in terms of a necessary *resultant structure* from the process. The process itself is not at issue. The device claims are *not* limited to the recited process. See MPEP 2113; *In re Brown*, 173 USPQ 685 (CCPA 1972); *In re Fitzgerald*, 205 USPQ 594 (CCPA 1980); *In re Marosi*, 218 USPQ 289, 292-293 (CCPA 1983); *In re Thorpe*, 227 USPQ 964 (Fed. Cir. 1985). In terms of *resultant structure*, the "ion implanted" region is taken as a region of N or P conductivity type.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 54-56, 73, 74 and 77 are rejected under 35 U.S.C. 103 as unpatentable, the evidence being Schuegraf et al, Kooi et al and Joo et al, considered together. The "first" area and dielectric material reads on dielectric film 24 of Schuegraf et al (Figure 3D); the "second" area and dielectric material reads on different dielectric material 26. For a "field implant dose" as in Schuegraf et al (column 4, lines 32-36, "field threshold voltage is influenced by a number of physical and material properties of the trench isolator such as . . . substrate doping, field implant dose"), it

would have been obvious to use a field implant region with a higher doping concentration similar to zone 6, 28 or 44 of Kooi et al (Figures 2, 10, 17), or layer 68 of Joo et al (Figure 15). Such an obvious field implant region would be a channel stop as in Joo et al. An "active" region reads on a region adjacent a trench which is "displaced away from" a field implant doped region under trench dielectric 26 (claim 73). The "memory" device (claim 73) or "memory cell" (claim 77) reads on a typical DRAM application taught by Schuegraf et al (column 4).

The impurity concentration of a field implant region establishes a "field threshold voltage" (claim 54) as noted by Schuegraf et al (column 4, lines 32-36, "field threshold voltage is influenced by a number of physical and material properties of the trench isolator such as . . . substrate doping, field implant dose"). The "first" dielectric material 24 is "on a bottom" of an "isolation" trench 22 (claim 74).

The width of a isolation trench is approximately 250 nm (column 4, lines 23-26), the thickness of "first" area dielectric 24 is at least 5 nm (column 5, lines 12-15), so that the "first" area on both sides of trench 22 would be 10/250, which is less than 40 percent, of the width of the isolation trench (claim 55). At least "about" 100 angstroms (claim 56) is taken to encompass at least 50 angstroms. Alternatively, it would have been obvious to chose a thickness of dielectric material 24 comparable and consistent to at least 50 angstroms (5 nm) suggested by Schuegraf et al. A field implant region below trench dielectric 26 is "displaced" from a surface "active" region adjacent to the trench 22 by at least a fraction of the depth of the trench (column 4, lines

23-26, 200 nm equals 2000 angstroms), which fraction would equal at least 100 angstroms, which is a distance "at least equal" to the thickness of "first" dielectric material 24 (claim 73).

The conclusion is that the claimed invention as a whole would have been obvious at the time the invention was made to a person of ordinary skill in the art. The hypothetical person of ordinary skill in the art, familiar with all that Schuegraf et al, Kooi et al and Joo et al disclose, "would have found it obvious to make a structure corresponding to *what is claimed.*" *In re Sovish*, 226 USPQ 771, 774 (Fed. Cir. 1985).

The references are of record.

The arguments in the response, filed 22 January 2003, have been considered but are not wholly persuasive, as noted above. Contrary to the response (pages 7-8), you cannot show non-obviousness by attacking references individually where, as here, the rejection is based on a combination of references. *In re Keller*, 208 USPQ 871, 882 (CCPA 1981).

Claims 45, 46, 50-52 and 68-70 are allowed over the art of record.

This action is **FINAL**.

This action is a **final rejection** and is intended to close the prosecution of this application. Applicant's reply under 37 CFR 1.113 to this action is limited either to an appeal to the Board of Patent Appeals and Interferences or to an amendment complying with the requirements set forth below.

If applicant should desire to appeal any rejection made by the examiner, a Notice of Appeal must be filed within the period for reply identifying the rejected claim or claims appealed. The Notice of Appeal must be accompanied by the required appeal fee of appropriate amount.

If applicant should desire to file an amendment, entry of a proposed amendment after final rejection cannot be made as a matter of right unless it merely cancels claims or complies with a formal requirement made earlier. Amendments touching the merits of the application which otherwise might not be proper may be admitted upon a showing a good and sufficient reasons why they are necessary and why they were not presented earlier.

A reply under 37 CFR 1.113 to a final rejection must include the appeal from, or cancellation of, each rejected claim. The filing , whichever is longer, of an amendment after final rejection, whether or not it is entered, does not stop the running of the statutory period for reply to the final rejection unless the examiner holds the claims to be in condition for allowance. Accordingly, if a Notice of Appeal has not been filed properly within the period for reply, or any extension of this period obtained under either 37 CFR 1.136(a) or (b), the application will become abandoned.

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the

date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication should be directed to G. Munson at telephone number (703) 308-4925 or 0956.

Munson

2/06/03

Gene M. Munson

GENE M. MUNSON
EXAMINER
GROUP ART UNIT 2811